

2. ~~[Lift and strike welding process according to claim 1, wherein]~~ The process claimed in Claim 1 wherein:

a. setting the first voltage ~~[is set, in terms of its magnitude,]~~ higher than a subsequent second voltage of reverse polarity.

3. ~~[Lift and strike welding process according to claim 1 or 2,]~~ The process claimed in Claim 2 wherein:

a. adjusting the first voltage ~~[is adjusted with]~~ to a positive polarity.

4. ~~[Lift and strike welding process according to one of claims 1 to 3,]~~ The process claimed in Claim 3 wherein:

a. [the element is welded onto the component after the component has previously been covered with a coating, in particular] coating the stud (4) with a lubricant layer for a cold-forming machining operation~~[, preferably a deep drawing machining operation]~~ prior to welding the stud (4) onto the surface (5).

5. ~~[Lift and strike welding process according to one of claims 1 to 4,]~~ The process claimed in Claim 4 wherein:

a. [after a drop of the first voltage a polarity of] reducing the first voltage to [changes in] a zero-current state[,];

b. using a pilot voltage of a different polarity at the start of the [a] welding process;  
and

c. [using preferably a pilot voltage and] subsequently raising the [welding] voltage [then ensues, wherein both voltages have a different polarity to the first voltage] to a welding voltage thereafter.

6. ~~[Lift and strike welding process according to one of claims 1 to 5,]~~ The process claimed in Claim 5 wherein:

- a. ~~[upon attainment of a passage through zero of the first voltage a]~~ maintaining the zero voltage [is maintained] for a predetermined period of time, [after which] a second voltage is [built] building up and applying the second welding voltage.

7. ~~[Second lift and strike welding process, in particular according to one of claims 1 to 6,]~~ The process claimed in Claim 6 wherein:

- a. an electric cleaning current flows between a surface (5) of [a] the component and [an element to be] the stud (4) welded thereon[;] with the stud (4) resting [in that the component rests] on the surface (5); [and then the element] lifting the stud (4) [is lifted] off the surface (5) up to an approximately[; in terms of time,] constant distance for removing a coating from the surface (5) through ignition of an arc as a cleaning agent[;]
- b. changing the polarity of [then] the current [changes its polarity], wherein afterwards at least one welding current is produced; and
- c. [then the element] welding the stud (4) [is welded] to the surface (5).

8. ~~[Lift and strike welding process according to one of claims 1 to 7,]~~ The process claimed in Claim 7 wherein:

- a. using a [the] cleaning current [assumes a current intensity] of between 15 amperes and 500 amperes [before it drops.]; and
- b. reducing the cleaning current after the cleaning operation.

9. ~~[Lift and strike welding process according to claim 7 or 8,]~~ The process claimed in Claim 8 wherein:

- a.** ~~[after a reversal of the polarity an, in terms of magnitude,]~~ reversing the polarity of the current; and
- b.** applying a maximum welding current ~~[is produced]~~ to weld the stud (4) to the surface (5).

10. ~~[Lift and strike welding process according to one of claims 1 to 9,]~~ The process claimed in Claim 9 wherein:

- a.** moving the stud (4) ~~[the element (4) is brought back]~~ into contact with the surface (5) ~~[only]~~ after disconnection of the welding current.

11. ~~[Lift and strike welding process according to one of claims 1 to 10,]~~ The process claimed in Claim 10 wherein:

- a.** applying the cleaning current ~~[lasts]~~ as long as or longer than ~~[a]~~ the pilot current, which ~~[flows]~~ is applied prior to applying the welding current ~~[and/or the welding current].~~

12. ~~[Lift and strike welding process according to one of claims 1 to 11,]~~ The process claimed in Claim 11 wherein:

- a.** applying a ~~[the]~~ welding current that is equal to or stronger than the cleaning current.

13. ~~[Lift and strike welding process according to one of claims 1 to 12,]~~ The process claimed in Claim 12 wherein: ~~[the element (4) during cleaning of the surface (5) assumes a distance (S) from the surface (5) which is at least two times greater than the distance (S) from the surface (5) during welding, in particular when a pilot current flows prior to the welding current.]~~

a. raising the stud (4) to a predetermined distance (S) for cleaning which is at least two times greater than the distance (S) for welding that the stud (4) is raised above the surface (5).

14. ~~[Lift and strike welding process according to one of claims 1 to 13,]~~ The process claimed in Claim 13 wherein: ~~[through the measurement of a parameter a duration of the cleaning step is regulated or controlled.]~~

a. controlling the time period of the cleaning process by measuring the current at the surface (5).

15. A Lift-and-strike welding apparatus (1) having a guide (9) for a weld-on [element] stud (4) and a control device (10) [or regulator] for the guide (9) [as well as] and a programmed device (11) for controlling or regulating the electric current and [or] the voltage used for welding, [wherein] the lift-and-strike welding apparatus (1) [comprises] comprising:

a. a polarity reversing means (12) for the voltage used for welding [characterised in that] included in the programmed device (11) [for controlling or regulating the electric current and/or the voltage used for welding is programmed or operated in such a way as to produce, prior to the welding operation,] to provide a cleaning current which has a reverse polarity compared to the welding current that is produced prior to the welding operation.

~~[16. — Lift and strike welding apparatus (1) according to claim 15, characterised in that said apparatus is designed for implementing a process according to claims 1 to 14.]~~

~~[17] 16. [Lift and strike welding apparatus (1) according to one of claims 5 or 16, characterised in that said apparatus comprises]~~ The combination claimed in Claim 15 wherein:

a. the programmed device (11) has a focusing device [for] to produce an arc which is to be struck.

~~[18]17.~~~~[Lift and strike welding apparatus (1) according to one of claims 15 to 17, characterised in that the]~~ The combination claimed in Claim 16 wherein:

a. the programmed device (11) has a polarity reversing means (12) [comprises] to produce a shorted circuit for maintaining [a] the struck arc during a reversal of the polarity.

~~[19]18.~~~~[Lift and strike welding apparatus (1) according to one of claims 15 to 18, characterised in that said apparatus comprises]~~ The combination claimed in Claim 17 wherein:

a. the welding apparatus (1) has an evaluation device[, particularly for quality inspection, for at least one parameter at least of] that operates during the cleaning operation to inspect the quality of the cleaning.

~~[20]19.~~~~[Polarity reversing means (12) for a lift and strike welding apparatus in particular according to one of claims 15 to 19, characterised in that]~~ The combination claimed in Claim 18 wherein:

a. the polarity reversing means (12) [comprises] has a circuit element[7];

b. [which] the circuit element produces an arc current [in order to] maintains [a] the struck arc during [a] the reversal of a polarity of the arc voltage.

~~[21]20.~~~~[Polarity reversing means (12) according to claim 20, characterised in that]~~ The combination claimed in Claim 19 wherein:

a. [the polarity reversing means (12) comprises] a first (13) [and a second (14)] power source[7] formed in the polarity reversing means (12) wherein the first power source (13) [supplies] to supply a cleaning current to the welding apparatus (1); and

**b.** ~~[the] a~~ second power source (14) formed in the polarity reversing means (12)  
[supplies] to supply a pilot current and~~[/or]~~ a welding current to the welding  
apparatus (1).

~~[22]21.[Polarity reversing means (12) according to claim 20 or 21, characterised in that] The~~  
combination claimed in Claim 20 wherein:

a. a coil (15) is connected to the second power source (14) ~~[in such a way that a]~~ to  
maintain the struck arc ~~[continues to be maintained]~~ during ~~[a]~~ the reversal of the polarity.

~~[23]22.[Aluminum surface with welded on element (4), wherein the aluminum] The~~  
combination claimed in Claim 15 wherein:

a. the surface (5) is formed of aluminum;

b. the surface (5) has ~~[or has had]~~ a lubricant coating (8) ~~[, in particular a lubricant~~  
~~layer,]~~ formed thereon during its manufacture ~~[d using a process according to~~  
~~one of claims 1 to 14].~~

~~[24]23.[Steel sheet with welded on element, wherein the steel sheet surface has or has had a~~  
~~coating, in particular a lubricant layer or a zinc layer, manufactured using a process according~~  
~~to claims 1 to 14.] The combination claimed in Claim 15 wherein:~~

a. the surface (5) is formed of steel sheet; and

b. the surface (5) has a lubricant coating formed thereon during its manufacture.

#### REMARKS

The Applicant's Attorney has amended the specification and the claims to place the case in keeping with the United States patent practice. For convenience, **a clean version of the amended claims is attached hereto as Attachment I.**